CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A fuel injector, comprising:

a spool slidable between a first position and a second position;

an intensifier body positioned proximate to the spool;

a compression assembly means slidably positioned within the intensifier body for compressing fuel in a high pressure chamber;

fuel passageway means for supplying fuel to a fuel nozzle; and

a delay piston assembly formed between the high pressure chamber and the fuel passageway means for metering fuel between the high pressure chamber and the fuel passageway means.

2. The fuel injector of claim 1, further comprising a first disk in fluid communication with the high pressure chamber and a second disk contacting the first disk.

3. The fuel injector of claim 2, wherein the delay piston assembly is positioned within at least the first disk.

4. The fuel injector of claim 2, wherein a combination of an upper surface of the first disk, an end portion of the compression assembly means and an interior wall of the intensifier body forms the high pressure chamber.

5. The fuel injector of claim 2, further comprising a groove positioned about the delay piston assembly within the first disk.

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6. The fuel injector of claim 2, wherein the first disk and the second disk include fuel bores in fluid communication with the nozzle and the delay piston assembly.

7. The fuel injector of claim 1, wherein the delay piston assembly includes:

a bore in fluid communication with the high pressure chamber;

a delay piston positioned within the bore;

a biasing spring disposed within the bore and which biases the delay piston in a first position; and

a groove formed within the disk and surrounding a portion of the delay piston.

8. The fuel injector of claim 7, further comprising a channel and outlet throttle in fluid communication with the bore, the channel and the outlet throttle allowing fuel to spill to ambient.

9. The fuel injector of claim 7, wherein the delay piston allows a pilot quantity of fuel to be injected into a combustion chamber of an engine during a pre stroke phase of the compression assembly means.

10. The fuel injector of claim 9, wherein the pilot quantity of fuel is approximately one cubic millimeter which is allowed to pass through the groove when the delay piston is in the first position.

11. The fuel injector of claim 10, wherein the delay piston contacts the intensifier body in the first position.

12. The fuel injector of claim 11, wherein the delay piston prevents fuel from flowing through the groove and into the fuel passageway means from the high pressure chamber

10045065 - 041505

when the delay piston is in the first position.

13. The fuel injector of claim 10, wherein the delay piston compresses the biasing spring and permits fuel to flow through the groove and into the fuel passageway means from the high pressure chamber when the delay piston is in the second position.

14. The fuel injector of claim 1, wherein the delay piston compresses the biasing spring and overlaps with the groove when the delay piston is in a second position remote from the first position.

15. A delay piston for a fuel injector, comprising:

a body having an upper surface and a lower surface;

a fuel bore extending between the upper surface and the lower surface;

a piston bore in fluid communication with the fuel bore;

a biasing spring positioned within the piston bore;

a piston moveable between a first position and a second position and positioned within the piston bore, the biasing spring biasing the piston in the first position; and

a groove surrounding the piston bore and in fluid communication with the fuel bore, the piston partially overlapping the groove when the piston is in the second position.

16. The delay piston of claim 15, wherein the piston partially completely overlaps the groove when the piston is biased towards the first position.

17. A method of providing a pilot quantity of fuel into a combustion chamber of an engine during a pre-stroke phase of a fuel injector, comprising the steps of:

providing fuel into a high pressure chamber of an intensifier body of the fuel

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injector;

shifting a spool from a start position to an open position thereby allowing pressurized fluid to push a piston and plunger assembly downwards towards the high pressure chamber;

compressing the fuel within the high pressure chamber such that a piston assembly, positioned proximate to the high pressure chamber, moves from a first position to a second position;

allowing a pilot quantity of fuel to pass from the high pressure chamber to a fuel nozzle and past the piston assembly when a piston of the piston assembly is moved to the second position.

18. The method of claim 17, further allowing fuel to flow to ambient when the piston assembly is moved between the first position and the second position.

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